SECTION 4.0 – CUMULATIVE PROJECTS ANALYSIS

4.1 BOUNDARY OF CUMULATIVE PROJECTS STUDY AREA

The cumulative environment study is presented as separate components:

- Consideration of the other marine terminals operating in the Bay Area (Section 4.2.1).
- Foreseeable projects in the general vicinity of Shore Terminals (Section 4.2.2).
- Projects in or near the shipping lanes, utilized by other carriers, not only for petroleum but for transport of other goods and materials within the Carquinez Strait, San Pablo Bay and San Francisco Bay (Section 4.2.3).
- Because vessels in transit are not the responsibility of Shore Terminals, but yet could have an accidental spill/release of oil in Bay or outer coast enroute to Shore Terminals, a general overview of cumulative impacts has been assessed herein. Cumulative impacts on the coast area from San Francisco Bay north to the Oregon/California border and south to Santa Cruz were previously addressed in the EIR for consideration of a new lease for the Unocal (now ConocoPhillips) Marine Terminal (Chambers Group 1994). Cumulative impacts relevant to tanker traffic on the shipping lanes from San Francisco Bay south to southern California were previously addressed in the GTC Gaviota Marine Terminal Project Final Supplemental EIR/EIS (Aspen Environmental Group 1992). Even though these documents are at least 10 years in age, the general types of cumulative outer coast impacts that could occur from outer coast shipping associated with the Shore marine terminal would be similar to these previous analyses. A description of the regional characteristics of transport in the Bay Area and outer coast is presented in Section 4.3.

4.2 GENERAL DESCRIPTION OF CUMULATIVE ENVIRONMENT

4.2.1 <u>Marine Facilities</u>

Five of California's largest refineries are located within Carquinez Strait and San Pablo Bay. The cumulative environment for this project includes marine facilities along the shoreline within these areas. The Shore terminal receives petroleum crude and products for storage and pipeline transfer to several of these refiners in Carquinez Strait.

These refineries include Shell Martinez, Tesoro at Avon, Valero at Benicia, ConocoPhillips at Rodeo, and Chevron at Richmond. These refineries generally run a combination of foreign, Alaskan North Slope (ANS) and some San Joaquin Valley (SJV) crudes. All of these refineries have marine terminals. In addition to receipt of oils via the marine terminals, transport also occur via pipelines. At present, Shell, Tesoro, Valero, and ConocoPhillips have pipeline connects to the Shore marine terminal. Other pipelines in the area include the Texaco pipeline from the SJV, a heated, proprietary system that supplies San Joaquin Valley Heavy (SJVH) crude to ConocoPhillips, Valero, and Shell. ConocoPhillips facility in Santa Maria processes local heavy crude, including some from the outer continental shelf (OCS) and SJVH and transports the product stream to ConocoPhillips Rodeo for further refining through ConocoPhillips Oleum Pipeline. Chevron Pipeline Company also operates a common carrier line importing SJV crude to the Bay Area. ConocoPhillips, Shell, and Chevron-Richmond all have connections to this pipeline.

In addition to the above refineries, there are 8 ports, 26 marine terminals, and 2 naval terminals in the Bay. The naval terminals include the Concord Naval Weapons Depot. The Point Molate Naval Fuel Depot, just north of the Chevron Refinery, is undergoing base closure activities (see Section 4.2.3). The former Moffat Naval Air Station has been closed and is currently used for NASA operations.

Figure 4.2-1 shows the Bay Area and the location of the various marine terminals. A breakdown of vessel calls in terms of passenger and cargo vessels, tanker traffic, tow or tug, and barges is provided in Section 4.3, with numbers based on *Waterborne Commerce of the United States, Calendar Year 2000, Part 4 – Waterways and Harbors of the Pacific Coast, Alaska and Hawaii* (Corps 2000). For discussion purposes, the marine terminals have been grouped as follows:

- Carquinez Strait and farther inland,
- Richmond Area,
- Port of San Francisco,
- Port of Oakland/Alameda, and
- Port of Redwood City.

Carquinez Strait and Farther Inland

A number of terminals are inland of the Carquinez Bridge. Terminals in Carquinez Strait include C & H Sugar Company Refinery (for sugar processing only), and several marine terminals including; Shore Terminals LLC, Martinez Refinery Company Wharf; Tesoro Corporation, Amorco, and Avon Wharves; Valero Benicia Refinery crude oil and product wharf; and Tesoro Corporation, Pittsburgh. The Concord Military Ocean Terminal is located in Concord, and other terminals for non-petroleum products are also located in Pittsburgh. Other terminals are located in Suisun Bay, Sacramento, and Stockton. In 2000, there were 2,544 vessel calls through the Carquinez Strait, including 320 tankers (Corps 2000).

4.2-1 – Location of Major Bay Area Terminals

Port of Richmond/Richmond Area

Facilities in the Richmond area occur in three areas: at Richmond, on Harbor Channel, and on Santa Fe Channel. The Port of Richmond provides seven City-owned terminals on a 35-foot shipping channel. These facilities handle commodities such as petroleum products, chemicals, petrochemicals, vegetable oils, molasses, vehicles, steel and wood articles, and containerized articles. Two concrete finger piers are available for vessel lay-ups, with five dry docks for lay-ups. At Point Richmond, just south of the Richmond-San Rafael Bridge but north of the Port of Richmond, is the Chevron Long Wharf and Refinery. The wharf includes four deep-water cargo berths.

The Port of Richmond also includes 11 privately owned terminals. The facilities handle bulk liquid products, scrap metal, various dry-bulk, and break-bulk commodities. The Chevron USA petroleum shipping and terminal operation facility is located in the Richmond area.

Five major facilities are on Santa Fe Channel. The Shore, Richmond Company Wharf is used for receipt and shipment of petroleum products. The Levin-Richmond Terminal Berths A, B, and C are used for receipt and shipment of dry bulk cargo, chemicals, and steel. The IMTT (former Texaco) Wharf is used for receipt and shipment of petroleum products, as is the Burmah-Castrol Wharf. The National Gypsum Company dock is used for receipt of gypsum rock.

In 2000, there were 353 tanker calls out of a total 5,626 vessels calls (Corps 2000).

Port of San Francisco/San Francisco Harbor

The Port of San Francisco is the nation's twelfth largest port. A portion of all marine traffic into and out of the San Francisco Harbor area occurs at this port. The port's marine facilities cover 145.1 acres and include cargo handling for containers, roll-on roll-off goods, and break-bulk commodities. The port operates eight shoreside container cranes in 40-foot water and provides full on-dock rail service. Since 1988, container vessel calls in/out of the Port of San Francisco have averaged about 600 per year (Long-Term Management Strategy [LTMS] 1998), but dropped to about 440 in 1993. San Francisco's location has made the Port unattractive for intermodal container shipping. Transfer of eastbound containers by rail from San Francisco to freight yards in the East Bay can take 2 days; therefore, shipping lines will call at Oakland and avoid the delay (BCDC and MTC 1997). In 2000, tanker calls numbered 96 (Corps 2000), while total vessel calls for the entire San Francisco Harbor area were 28,562 vessels, the majority of which is passenger traffic (Corps 2000).

Port of Oakland/Oakland Area

The Port of Oakland occupies 19 miles of waterfront on the eastern shore of San Francisco Bay, with 665 acres devoted to maritime activities and another 3,000 acres devoted to aviation activities. The seaport ranks among the top 4 in the nation and 20 in the world in terms of annual container traffic. The port has over 550 acres of marine terminal facilities, 450 acres of which support container terminals, 27 deepwater berths, and 32 container cranes, including 12 new large container cranes that have been added between 2000 and 2002. Over 30 shipping lines call at the port. The port is creating the infrastructure necessary to accommodate anticipated future increase cargo demands in accordance with the Port of Oakland Vision 2000 Program and the Port of Oakland Strategic Plan. The Oakland area also supports numerous other terminal facilities not strictly within the Port of Oakland, but considered a part of the Oakland area. These include additional container terminals and a variety of large and small recreational craft harbors. Records for 2000 show that out of 6,555 vessel calls, 3,798 were passenger and cargo vessels, and 11 were tanker calls (Corps 2000).

The Oakland Army Base (OARB), consisting of 368 acres, is also located in this area, and has been approved by the Department of the Army for closure. The Corp is conducting environmental investigations and cleanup activities under the Installation Restoration Program at OARB as part of the base closure process. OARB offers easy access to San Francisco and the East Bay. Existing Port of Oakland facilities at the site will continue to be used by the Port, and a reuse plan for the other portions of the site is in process. Property to be acquired by the Port from the Army will be used to construct new Outer Harbor mega-terminals (Port of Oakland Strategic Plan Summary FY 2002-2006, June 2001).

Port of Redwood City

The Port of Redwood City handles primarily cement, lumber, scrap metal, and dry bulk commodities for firms located near the port. The port also has facilities for handling liquid bulk, petroleum products, and general cargo. The port is also a USCG certified oil waste reception facility. Facilities include five wharves. Total vessel calls were approximately 215 in 2000, including 0 tankers (Corps 2000).

4.2.2 Other Projects in Vicinity of Terminal

New Benicia-Martinez Bridge and Retrofit Project (I-680)

The California Department of Transportation (Caltrans) is retrofitting the existing bridge and constructing a new bridge across the Carquinez Strait between Benicia and Martinez for traffic on Interstate 680 (I-680). The new bridge is being built east of the existing railroad bridge, which lies east of the existing vehicular bridge. The existing bridge will be converted to one-way traffic. Because of the high volume of vessel traffic that passes through Carquinez Strait, hydraulic fenders similar to those on the existing I-680 bridge are proposed. In addition to the construction of the new bridge, the project also includes improving highway approaches to the bridge, expansion to four lanes, carpool lane, bicycle and pedestrian path, as well as new toll plaza facilities. Retrofitting began in August 1998 and was completed in 2002. The construction of the new bridge began in fall 2001 and is expected to last for approximately 3.5 years (personal communication, S. Cobb 2002).

Carquinez Bridge Replacement Project (I-80)

The Carquinez Bridge consists of two separate bridges, one for westbound and one for eastbound traffic. Caltrans is currently replacing the bridge that carries the westbound lanes of I-80 over the Carquinez Strait. The westbound bridge was constructed in 1927, and is one of the two steel truss bridges often referred to in combination as "the Carquinez Bridge." The project is needed because the existing bridge does not meet current seismic design or traffic safety standards. The bridge is being completely replaced with a suspension bridge, which is located west of the existing bridge. Construction began in January 2000, and the bridge is expected to open to traffic in late 2003 with three mixed flow lanes, a carpool lane and a pedestrian/bicycle path. Ramps will be completed in 2004. Once the bridge has been opened, the existing bridge will be dismantled by 2005.

San Francisco Bay to Stockton Phase III – John F. Baldwin Navigation Channel Project

The proposed channel deepening involves deepening approximately 16 miles of existing navigational channels extending from north of Angel Island and central San Francisco Bay to the vicinity of Pacheco Creek in Suisun Bay to 35 feet. The purpose of the channel deepening is to provide improved direct access of large oil tankers to the petroleum refineries and terminals adjacent to the Carquinez Strait. This would reduce vessel-to-vessel lightering of crude oil at Anchorage No. 9 and reduce tanker traffic in San Francisco Bay. Once dredging and disposal for the channel deepening alternative began, the project should take approximately 30 months to complete. The project is currently in the concept phase and funding availability is being studied (personal communication, M. Dillabough, 2002).

Mare Island Reuse

Mare Island is located on the western edge of the city of Vallejo in southwestern Solano County. Mare Island, approximately 3.5 miles long and one mile wide, occupies approximately 5,460 acres of which 1,650 acres are developed uplands. Tidal and non-tidal wetlands comprise the remaining acreage. The Island is relatively flat and ranges in elevation from sea level to 285 feet above sea level in the southern regional park area. Mare Island has approximately 960 buildings which comprise about 10.5 million square feet of industrial, office, residential, commercial, and recreational facilities.

Mare Island offers an abundance of transportation possibilities. It is flanked by the Napa River on the east, the Sacramento River on the south, and San Pablo Bay on the west. These water transit routes provide a bounty of possible uses of the over 1.5 miles of piers and docks. The Island is also served by Northern California Rail Road with a direct link to the Southern Pacific main line. Mare Island is strategically located with State Highway 37 directly off the northern end of the Island connecting the eastern area of San Francisco Bay with the northern area. Interstate 80 runs along the eastern boundary of the City and is a short 10-minute transit from the Island. Conversion of the Mare Island Naval Shipyard and related properties from military to civilian use continues. The land has been transferred to the city of Vallejo for redevelopment. In

May 2002, the City Council approved a feasibility study for construction and operation of a liquid natural gas facility and a 1,500-megawatt power plant on Mare Island. The four to six-month study is being conducted by Shell and Bechtel, partners in the Proposed Project (www.mareislandenergy.com).

Deepening of the Suisun Bay Channel for the Concord Naval Weapons Station

The Concord Naval Weapons Station is on the southern shore of the Suisun Bay in northern Contra Costa County, between the cities of Martinez and Pittsburgh. The Weapons Station ships munitions around the world. Deepening the channel would allow for more efficient cargo handling, including the introduction of containerized cargo. Although there is no estimate for total dredge material volume, the sediment is expected to be relatively clean because the channel has been subject to periodic maintenance dredging. In 1998/1999, the Navy funded reconnaissance-level studies to determine whether or not deepening the Bay from -35 feet to -42 feet MLLW would be feasible. At that time, the Navy also considered an alternative to construct a new pier, which would preclude deepening the channel. However, funding did not become available and the Navy is not pursuing either project at this time, but could in the future (personal communication, M. Dillabough, 2002).

Land-Based Cumulative Projects

Land-based development over the 20-year period of the proposed lease extension would be guided, in part, by the long-term plans outlined in the Contra Costa County General Plan, the city of Martinez General Plan, the San Francisco Bay Plan, and other applicable land use planning documents. Local jurisdictions are required by the State of California to prepare general plans identifying goals and policies that will guide development within their respective jurisdictions. Therefore, the general plans, specific plans, and zoning ordinances of the cities and counties around the project (i.e., the city of Martinez and Contra Costa County) and the rest of the near-shore area for the bay and California coastline would address land use policies and likely development patterns. Although it is impossible to accurately predict the exact location and intensity of future development, it is expected that future development will continue to expand within a framework that is comparable to the existing landscape.

According to the city of Martinez, no new projects are planned for the area immediately adjacent or proximate to the Shore project site (City of Martinez, 2003). No significant related projects are proposed or expected in the city of Martinez that would be directly applicable to the Shore terminal (City of Martinez, 2003). The Proposed Project site is located in an area with an industrial land use and zoning designation, and there is very little chance that a non-industrial, incompatible use would be built in the surrounding area within the 20-year term of the proposed lease extension (City of Martinez, 2003).

According to the city of Martinez, the most applicable projects to the Shore site are (1) the recently completed expansion of Copart Auto, located adjacent to the Shore site at 2701 Waterfront Road; and (2) the proposed Waters Moving and Storage project, a 51,374 square feet warehouse, wash rack and office building complex located on Bridgehead Road, approximately 1.5 miles west of the project.

Table 4.2-1 summarizes other applicable proposed or planned land-based projects within approximately 8 miles of the project. Due to the large size of the study area (which encompasses much of the shoreline and near-shore areas of the bay and San Francisco coastline), it is not possible to comprehensively list all potentially applicable land-based projects.

4.2.3 Projects In or Near Bay Area Shipping Lanes

Long-Term Management Strategy (LTMS) Program

The LTMS program is designed to provide a regional plan for the disposal of dredged material from the San Francisco Bay over the next 50 years. The LTMS program began in January 1990 as a federal/state partnership among the four agencies that have regulatory authority for dredged material in the San Francisco Bay, and include the Corps, the U.S. Environmental Protection Agency (EPA) Region IX, the San Francisco Bay Regional Water Quality Board (SF-RWQCB), and the San Francisco Bay BCDC. These four lead agencies share responsibility for managing the various components of the LTMS. The LTMS Final EIS/EIR indicates that approximately 6 million cubic yards (mcy) of sediments must be dredged and disposed each year from shipping channels and related navigational facilities in the Bay Area. The estimated total volume of dredged material that would require disposal over the 50-year LTMS planning horizon is approximately 300 mcy. The policy alternatives involve different volumes of dredged sediment being disposed at in-Bay, ocean, and upland/wetland reuse sites. Under current regulatory conditions, 80 percent or more of the dredged material would continue to be disposed at designated sites in the Bay, with only a small percentage of material disposed outside the estuary at the new offshore ocean site or used in “beneficial reuse” applications, such as wetlands restoration.

Ferry Point Pier and Terminal Projects

The Miller-Knox Regional Shoreline Land Use-Development Plan (LUDP) was amended in October 1995 to include the Ferry Point Pier and Terminal projects. The Miller-Knox Regional Shoreline is located off of Point Richmond and just north of the north end of the Richmond Harbor Channel entrance. The Ferry Point parcels, including the Ferry Point Terminus site and the Ferry Point Pier, have recently been given zoning and land use designations appropriate for their proposed uses. The Ferry Point parcels added a total of 28 acres to the Miller-Knox Regional Shoreline. Recreational uses have been established with some still in the planning process. These recreational uses include picnicking, shoreline fishing, pier uses, visitor center, educational and interpretive facilities, intermodal transportation linkages, park concessions, and special events. The Ferry Point Pier has been rehabilitated and fishing facilities have been established. Interpretive facilities are planned for the Pier recognizing its former use as a terminal for the Transcontinental Railroad. The shoreline area immediately adjacent to the water was made available for public enjoyment and education. Shoreline access has been included in the Bay Trail system and linked to the high use areas in Miller Knox. Maximum public access to the shoreline will include a shoreline trail, loop trails and pier access over the bay (Personal communication, M. Anderson, 2002).

In addition to the acquisition of the Ferry Point parcels and Pier, the Miller-Knox Regional Shoreline also recently acquired the Brae Property between the park and the Ferry Point parcels. This allowed for the contiguous Miller-Knox property extending through the Ferry Point parcels, bringing the total acreage to approximately 310 acres.

Table 4.2-1
Proximate Land-Based Cumulative Projects List

Project Name	Location	Approximate Distance to Project	Description
City of Martinez			
Ashford Place Apts.	480 Morello Ave.	Approx 6 miles to southwest	24 Townhomes
Marina Vista Courts	Berrellesa and Marina Vista	Approx 3.5 miles to west	8 Apts; 10,000 sf lot
Clayco Office Bldg	1380 Arnold Dr.	Approx 6 miles to southwest	3,940 sf Office Bldg.
Alhambra Highlands	Alhambra Hills	Approx 4 miles to southwest	144 Single Family Residential
Alhambra Vista	4990 Alhambra Ave.	Approx 5 miles to southwest	12 Single Family Residential
Claremont Homes	430-450 Glacier at Center		33 Single Family Residential
Elderwood Glen Highlands	Alhambra Hills	Approx 5 miles to southwest	3 Single Family Residential Lots
Karl Hempfling	2525 Reliez Valley	Approx 7.5 miles to southwest	3 Single Family Residential
Ahmanson Developments Inc.	Alhambra Hills	Approx 5 miles to southwest	68 Single Family Residential
Passport Homes	Vine Hill Way	Approx 7 miles to southwest	4 Single Family Residential
Passport Homes	Alhambra Ave.	Approx 5 miles to southwest	10 Single Family Residential
John Muir Inn Expansion	445 Muir Station Rd.	Approx 5 miles to southwest	25 room, 14,000 sf addition
Bob Brown Constr.	Sunrise Bus. Park	N/A	6,500 sf office
Brittany Place	Morello Hills Dr.	Approx 6 miles to southwest	5 Single Family Residential
Brittany Hills	Morello Ave.	Approx 6 miles to southwest	80 Single Family Residential
St. Nazaire Ct	St. Nazaire Ct.	N/A	10 Single Family Residential
Stonecliffe I	Hiller Lane	Approx 6 miles to southwest	15 Single Family Residential
Stonecliffe II	Milano Way	Approx 6 miles to southwest	27 Single Family Residential
Wisteria	Lance Ct.	Approx 7 miles to southwest	23 Single Family Residential
Valley Vista	Alhambra Way	Approx 5 miles to southwest	11 Single Family Residential
Albertson's	1145 Arnold Dr.	Approx 6 miles to southwest	10,000 sf expansion
Copart Auto	2701 Waterfront Rd.	Adjacent to Shore, on east side	40 acre Auction Facility
Intermodal Facility	Amtrack Station	Approx 4 miles to west	Transportation Center
Muir Oaks Animal Hospital	Muir Rd. and Morello Ave.	Approx 6 miles to southwest	Animal Hospital
Walmart	1021 Arnold Dr.	Approx 6 miles to southwest	Commercial bldg.
Contra Costa County			
Clean Fuels Project, Phase II	66 Solano Way	Approx 3 mile to east	New refinery processing units to meet new fuel requirements
Realignment of Pacheco Blvd Underpass	Pachecho Blvd. at Burlington North Overpass	Approx 3.5 miles to southeast	Remove existing curvature of existing underpass
Mass Grading	Waterbird Way	Approx 2.5 miles to southeast	Proposal to grade 60,000 cy
Compost Recycling/Firewood Sales	Waterbird Way	Approx 2.5 miles to southeast	Proposed composting activities on 14.6 acre site
Vehicle Storage	Waterbird Way	Approx 1.5 miles to southeast	Proposed vehicle storage lot
Waterbird Regional Preserve	Waterbird Way and Waterfront Rd.	Approx 1 mile to southeast	Approved 50-acre wildlife park with picnic and staging area.

Oakland Harbor 50-Foot Deepening Project

Deepening Oakland Harbor to -50 feet MLLW would involve dredging approximately 12 to 13 mcy. The Corps submitted the Feasibility Study and Environmental Impact Statement/ Report to the Assistant Secretary of the Army for Civil Works in February 1999. The project was authorized in the 1999 Water Resources Act. The dredging and transport and disposal will take approximately 4 years with completion in 2006. The port will use all of the dredged material for beneficial reuse applications: 6 mcy will be used for habitat enhancement and the remaining 6 to 7 mcy will go to the Hamilton Airfield and Montezuma Wetlands (personal communication, D. Doak, 2002). Transport of dredged material may be via barge through the Bay.

Southampton Shoal Channel Deepening Project

This channel is immediately south of the Richmond-San Rafael Bridge. Southampton Shoal is the entrance to the Richmond Harbor and the Richmond Longwharf Maneuvering Area. A project to dredge the channel was considered by the Corps in 1998. The dredging would have deepened the channel from -45 feet to -50 feet, and resulted in as much as 9 mcy of sediment requiring disposal. The Richmond Ports and/or Contra Costa County would have been the likely sponsors for this future deepening. The reconnaissance phase of this project was completed. However, funding has not been received to move forward with this project and there are no plans to proceed at this time (personal communication M. Dillabough, 2002). However, this project could occur at some future point in time.

Richmond-San Rafael Bridge Seismic Retrofit Project

The bridge is a part of I-580 spanning Richmond (Contra Costa County) on the east across the Bay to Point San Quentin (Marin County) on the west. The approximately 4.5-mile-long bridge will be seismically retrofitted to withstand collapse from a future severe earthquake.

Seismic retrofit construction activities will occur within the same alignment as the existing bridge. During construction, two lanes of traffic will remain open at all times in each direction during peak commute hours and a minimum of one lane in each direction during noncommute hours. Development of seismic retrofit construction strategies on the bridge required separating the bridge into four segments: (1) concrete trestle section, (2) west approach structure, (3) main steel truss superstructure, and (4) east approach structure.

A single deck parallel concrete trestle extends from Point San Quentin to the west approach structure. This part of the bridge will be completely replaced along the existing alignment due to severe corrosion of the existing structure. Final designs of the seismic retrofit plans have been completed. Construction began in December 2000 and is expected to extend through the middle of 2005 (personal communication, G. Hembree, 2002).

Point Molate Reuse Project

In 1995, the Point Molate Navy Fuel Depot (Point Molate) was listed for closure and disposition under the Defense Base Closure and Realignment Act (BRAC) of 1990. The facility operationally closed on September 30, 1998, and is currently in caretaker status on the list for disposal. The Point Molate site covers approximately 290 acres in the Potrero Hills on San Pablo Peninsula on the eastern shore of San Francisco Bay. Point Molate is in the northern portion of the city of Richmond and is approximately 1.5 miles north of the Richmond-San Rafael Bridge. Point Molate is surrounded on the north, east, and south by Chevron. It will remain in federal ownership until its disposal. The effects of the navy disposal action and potential reuse of the property are subject to analysis under National Environmental Policy (NEPA) and CEQA. The Draft EIS/EIR for disposal and reuse was published for agency and public review on May 18, 2001. The Navy is currently conducting environmental cleanup activities which are expected to be completed by 2008. At that time, the city of Richmond would likely take over ownership, incorporating the *Point Molate Reuse Plan* (described below). However, the City is currently seeking early conveyance of the property contingent on the funding made available by the Navy to complete the environmental remediation. The City would retain a contract for services to assist in early conveyance, complete the remediation activities and develop the property in accordance with the Reuse Plan (personal communication G. Hembree, 2002). With closure, the city of Richmond established the City Council as the Local Reuse Authority (LRA). The LRA is the official governmental agency responsible for the reuse planning and disposition strategy for the Point Molate site. The reuse options include open space and recreational, educational, residential, and commercial developments, but implementation of any use is likely to take several years.

The *Point Molate Reuse Plan*, which was adopted by the Richmond City Council in March 1997, divides the Point Molate site into five distinct land use areas: the Core Historic District, which encompasses Winehaven and other historic buildings; the Northern Development Area, east of the pier; the Southern Development Area, southeast of the pier; Hillside Open Space, which generally covers the hillsides to the east of the pier and Shoreline Park, located at the base of the pier; and the Central Development Area, which is approximately 900 feet inland from the base of the pier. The Plan recommends mixed uses including single-family housing and various commercial uses such as a public market, amphitheater, boating center, and food concessions. To encourage tourists and other visitors to walk the distance from the pier to the Winehaven building, a promenade linking the pier and the public playa is proposed.

A private marina could be considered if the demand for one should increase. Transient mooring would be accommodated at the pier, as well as offshore buoys, and possibly a number of floating docks. Long-term mooring of large vessels at the pier could be made available to help meet a current Bay-wide need, assuming no dredging is required. A trail has been proposed around the perimeter of the Point Molate site as part of the

Reuse Plan. The trail would follow the right-of-way for the Richmond Belt Line Railroad and terminate at or near the Port of Richmond Terminal No. 4. If feasible, it could extend around the point to the Point San Pablo Yacht Harbor.

Red and White Ferry Terminal

The project is a ferry running between the city of Richmond and San Francisco. It is an interim harbor service that operated approximately 12 to 14 months. The project was constructed in spring 1999, and landside improvements were complete within 1 to 2 months. The landside improvements included onshore parking, lighting, and a ferry dock. The ferry is located at the foot of Harbor Way South at the Ford site. The project operated two ferries in the morning and two in the afternoon. The ferry was expected to run for an interim period until 2001 and potentially add improvements if successful; however, interim operations ceased in 2000 due to a lack of riders. The project is currently not operating, but may resume operations in the future if demand for the ferry should increase.

Lowering of Obstructing Rocks to 50 feet

There are underwater rocks located near Alcatraz and shipping lanes which pose a threat to safe navigation. The rocks are approximately 35 feet below the surface. They have been lowered a number of times since the turn of the century. The Corps has been studying the potential to lower the rocks to 55 feet. Due to the proximity of the rocks to the shipping lanes, lowering would allow for reconfiguration of the shipping lanes to allow greater separation zones between inbound and outbound ships. The San Francisco Bay Plan was amended to provide for the rock-lowering project. The method for lowering would include controlled breaking up of the rocks. The Corps determined in December 2003, that the lowering did not meet the Corps' cost/benefit ratio, therefore the project will not be going forward.

San Francisco Bay Ferry Network

As provided by Assembly Bill 428, the San Francisco Bay Area Water Transit Authority (WTA) is currently considering adoption of a San Francisco Bay Area water transit implementation and operations plan and will operate a comprehensive Bay Area regional public transit system. A Draft EIR was released in August 2002 (URS Corporation 2002a).

The WTA is considering expansion of the Bay's ferry service. Expansion of the ferry service may include several new routes. A route from Redwood City to Mission Bay and the Ferry Building in San Francisco would operate every 30 minutes using 150 passenger, 30-knot vessels. A new service from San Leandro to Redwood City would operate every 30 minutes and would connect the San Leandro marina with the Port of Redwood City using 150 passenger, 35-knot vessels. San Francisco Airport would be connected to downtown San Francisco, Moffett Field, and Oakland International Airport at Moffett Field. This service would require dredging of Moffett

Field and would operate every 20 minutes. A link would be established from downtown San Francisco to Moffet Field or the Port of Redwood City with downtown San Francisco and connecting services to the Oakland Airport for vessels dedicated for airport cargo only. Oyster Point Marina in South San Francisco would connect to the San Francisco Ferry Building with service every 15 minutes. By 2025, depending on which alternative may be selected, ferry trips crossing the Bay could numbers exceeding 1.2 million trips annually.

4.3 REGIONAL CHARACTERISTICS OF CRUDE/PRODUCT TRANSPORTATION IN BAY AND ALONG COASTAL SHIPPING LANES OFF NORTHERN CALIFORNIA

Many types of marine vessels call at terminals in the greater San Francisco Bay Area, including passenger vessels, cargo vessels, tankers, tow/tug vessels, dry cargo barges, and tank barges. Several sources track vessel transits into the Bay. These sources are generally limited to inbound/arrival information from outside to inside the Bay and do not include vessel transit information for transits originating in the Bay.

Table 4.3-1 presents information on inbound vessels transits only through the Golden Gate during 2000 (Corps 2000). The number of outbound transits would essentially be the same. With the exception of San Francisco Harbor, these numbers do not reflect vessel traffic transits originating in the Bay. Excluding San Francisco Harbor, 23,088 vessels called at terminals in the San Francisco Bay Area in 2000. Of these, 2,544 vessels called in Carquinez Strait, which includes the general area of the Shore marine terminal.

The Marine Exchange of the San Francisco Bay Region also tracks ship movements. Inbound ships by vessel type for 2001 are presented in Table 4.3-2. Over a 20-year period, the overall number of arrivals has remained fairly constant, ranging from a low of 2,897 arrivals in 1997 to a high of 3,779 arrivals in 1984. The mix of foreign to U.S. vessels has, however, dropped over the years. From 1982 through 1884, U.S. vessels ranged from 43 to 56 percent of total vessels. From 1995 through 2001, the percentage of U.S. vessels dropped to range from 30 to 44 percent of total vessels.

For the total ship traffic arrivals by ship type shown in Table 4.3-2, their destinations are presented in Table 4.3-3. "Shifts" included in Table 4.3-3 are those vessels that had movements from one part of the Bay to another. Of six anchorages located in the Bay, Anchorage 9, located south of the Bay Bridge between San Francisco and Oakland had the majority of arrivals at 710 of the total of 971arrivals. Some tankers bound for the Shore marine terminal occasionally transfer oil from one vessel to another (lighter) at Anchorage 9 which reduces the draft of the vessel prior to travel to its destination.

Table 4.3-1
Inbound Vessel Traffic in San Francisco Bay (2000)

Location	Type of Vessel					Total Number of Vessels
	Passenger & Cargo	Tanker	Tow or Tug	Dry Cargo Barge	Tank Barge	
San Francisco Bay Entrance	2,601	653	310	21	212	3,797
San Francisco Harbor	27,990[1]	96	382	64	30	28,562[1]
Redwood City Harbor	33	-	144	32	6	215
Oakland Harbor	3,798	11	2,243	467	36	6,555
Richmond Harbor	695	353	4,300	29	249	5,626
San Pablo Bay and Mare Island Strait	1,143	341	1,343	506	446	3,779
Carquinez Strait	174	320	1,372	267	411	2,544
Totals	**8,444[2]**	**1,774**	**10,094**	**1,386**	**1,390**	**23,088[2]**

Source: Corps 2000. Waterborne Commerce of the United States Calendar Year 2000 Part 4-Waterways and Harbors Pacific Coast, Alaska, and Hawaii.

Note: 1. Number of passenger and cargo vessels in Harbor reflect vessel traffic generated within the Bay, thus numbers shown exceed the number of vessels at the San Francisco Bay Entrance.

2. Total excludes San Francisco Harbor passenger and cargo.

Table 4.3-2
Golden Gate Ship Traffic – Arrivals by Type for 2001

Type of Vessel	Total
Break Bulk	113
Bulk Carrier	326
Chemical Tanker	87
Container, Full	1,705
Container, Part	14
Liquid Gas Carrier	18
Other	71
Passenger	39
Roll-on/Roll-off	46
Tanker	669
Vehicle Carrier	42
Total	**3,142**

Source: Marine Exchange, 2001.

Table 4.3-3
Golden Gate Ship Traffic
Destination of Golden Gate Arrivals 2001, Including Shifts

Destination	Total
Anchorages (6)	971
Oakland	1,856
North Bay Area	663
Antioch	10
Benicia	187
Concord NWS	2
Crocket Sugar	25
Martinez	254
Pittsburgh	47
San Pablo Bay	137
Redwood City	35
Richmond	624
Sacramento	81
San Francisco	202
Stockton	143
Total	**5,237**
Source: Marine Exchange, 2001.	

The CSLC Marine Facilities Division in Hercules also tracks ship and barge calls to those marine terminals for which they have jurisdiction. Table 4.3-4 presents those numbers for 2001.

Vessels entering and leaving the Golden Gate entrance to San Francisco Bay do so through the Traffic Separation Scheme which consists of a circular Precautionary Area with three traffic lanes (northern, main or western, and southern) exiting from the Precautionary Area. A detailed description of the regulated navigation areas is presented in Section 3.2 in the Operational Safety/Risk baseline conditions discussion.

Table 4.3-5 presents information on tanker origins and destinations and travel distances offshore of the California coastline when calling at terminals in the San Francisco Bay. The data are based on a USCG and National Oceanic and Atmospheric Administration (NOAA) special report to Congress and confirmed by recent data from the Marine Exchange. Vessels carrying crude are separated from vessels carrying products because product carriers sometimes transit closer to shore.

Imported cargo and associated vessel calls are expected to triple from 1995 to 2020 (LTMS 1998). Numbers taken from the Seaport Plan (BCDC and MTC 1997) show a projected increase from approximately 15 million metric tons to 44 million metric tons during this timeframe. The number of vessels is hard to estimate, as in the future, larger vessels will carry greater quantities of cargo than at present. The projected estimates reflect general cargo ports and terminals; commodities handled at proprietary terminals (including the Shore marine terminal) are not included in the projections.

Table 4.3-4
Vessel Calls to Marine Terminals in the San Francisco Bay in 2001

Marine Terminal	Vessels	Barges	Total
Shell Oil, Martinez	87	107	194
G.P. Resources	1	19	20
San Pedro Marine	0	0	0
Tesoro Amorco	35	0	35
Tesoro Avon	14	123	137
BC Stocking	0	2	2
ConocoPhillips, Rodeo	73	166	239
Shore, Martinez	108	109	217
Shore, Crockett	52	41	93
Chevron, Richmond	390	351	741
BP/Arco, Richmond	12	7	19
Shore, Richmond	11	172	183
Castrol, Richmond	0	4	4
Kinder Morgan, Richmond	9	1	10
IMTT, Richmond	33	497	530*
Tosco, Richmond	5	76	81
Valero, Benicia – berth #1	142	82	224
Valero, Benicia – berth #2	0	13	13
Total all Terminals	**972**	**1,770**	**2,742**

*** There were an additional 147 transfers to Tugs at this terminal. These vessel calls are not included in the total.**
Source: CSLC, Marine Facilities Division, 2002.

Table 4.3-5
Tanker Original/Destination to/from San Francisco Bay and Distance Traveled from Coast

Origin	Destination	Typical Distance From Coast (Miles)
Alaska	SF Bay	50+
Canada	SF Bay	25+
Oregon and Washington	SF Bay	25+
Asia and Hawaii	SF Bay	NA
Los Angeles	SF Bay	25+
Mexico, Panama, and South America	SF Bay	10+
SF Bay	Oregon and Washington	25+
SF Bay	Humboldt Bay	25+
SF Bay	Asia and Hawaii	NA
SF Bay	Port San Luis	10+
SF Bay	Los Angeles	50+ ANS crude 25+ other crude and products
SF Bay	Mexico, Panama, and South America	25+

Sources: USCG and NOAA, undated. Report to Congress on Regulating Vessel Traffic in the Monterey Bay National Marine Sanctuary as Required by Public Laws 102-368 and 102-587. San Francisco Bay Region Marine Exchange, 2002.

In 1992, after consultation with Office of Spill Prevention and Response (OSPR) and the USCG, 10 major oil company members of the Western States Petroleum Association (WSPA) reached agreement on the routing of tankers carrying Alaskan North Slope crude to California ports, committing their laden tankers to remain at least 50 miles seaward of the California coast while transiting the coastline. Although tankers carrying refined petroleum products along the West Coast are not subject to the WSPA agreement, a 1994 WSPA study based on interviews with its members determined that almost 90 percent of all tanker traffic is at least 25 miles offshore and nearly 50 percent are 50 miles offshore.

4.4 IMPACTS ANALYSIS AND MITIGATION MEASURES

4.4.1 Operational Safety/Risk of Accidents

Impact CUM-OS-1: Routine Operations

Routine operations associated with cumulative terminals would be expected to be similar to that described for the Shore terminal and impacts would be expected to be less than significant (Class III).

The Shore terminal is one of approximately 21 marine terminals operating in the Bay Area. All of these terminals transfer crude oil and/or petroleum products and therefore present the potential for a spill. In addition, the vessels (tankers and tank barges) calling at the terminals present the potential for a spill either inside or outside the Bay or both. All of the terminal operators have contracts with a USCG and OSPR approved Oil Spill Response Organization (OSRO) for assisting in responding to releases. There are no known plans for expanded or new marine terminals within the Bay area. Routine operations associated with these terminals would be expected to be similar to that described for the Shore terminal and impacts would be expected to be less than significant (Class III).

<u>CUM-OS-1: No mitigation is required.</u>

Impact CUM-OS-2: Upset Conditions

All terminals and tanker/barge operators are required by federal and state regulations to demonstrate that they have, or have under contract, sufficient response assets to respond to worst-case releases. Even so, oil spills can still result in significant, adverse impacts (Class I and Class II) to the environment depending on whether first response efforts can contain and cleanup the spill. Shore contributes incrementally to the cumulative environment.

Probability of Accidents – Spills from a Marine Terminal

As discussed in Section 3.1.3.1, a total of 128 spills have occurred from marine terminals in the San Francisco Bay from 1992 through 2001. This equates to approximately 13 spills per year. Only one (less than 1 percent) spills was from the Shore terminal. Tank vessel calls to the Shore terminal accounted for a little over 5 percent of the total tank vessel calls in the Bay; therefore, the spill rate at the Shore terminal was below the overall Bay Area average.

Probability of Accidents – Spills from Tankering Inside the Bay

Chambers Group (1994) used data from the Marine Exchange (1992), CSLC (1992), Corps (1990), USCG (1991), and nautical charts to estimate tanker and barge traffic within the Bay. Based on the amount of tanker and tank barge traffic along the various routes within the Bay, cumulative probabilities of a spill were developed for various sections within the Bay. These probabilities were then used to conduct the probabilistic oil spill modeling for cumulative tanker and tank barge traffic within the Bay.

The expected mean time between spills for all tanker and tank barge traffic inside the Bay for three minimum size spills is presented in Table 4.3-6. Based on estimated mileage traveled within the Bay, vessel traffic associated with the Shore terminal is approximately 5 percent of the total probability of a spill from tanker and tank barge traffic in the Bay.

Table 4.3-6
Cumulative Tank Vessel Expected Mean Time Between Spills Inside the Bay

Spill Size (bbls)	Expected Mean Time Between Spills (Years)
238	36
1,000	48
10,000	238

Probability of Accidents – Spills from Tankering Outside the Bay

Chambers Group (1994), using data from the Marine Exchange, which listed the last and next port of call for all tankers calling at marine terminals in the San Francisco Bay Area, estimated the number of annual tanker trips along various routes outside the Bay. The expected mean time between spills outside the Bay is shown in Table 4.3-7.

Table 4.3-7
Cumulative Tank Vessel Expected Mean Time Between Spills Outside the Bay

Spill Size (bbls)	Expected Mean Time Between Spills (Years)
1,000	42
10,000	123

Spill Response

An impact on spill response capability could occur if there were two or more spills at the same time; however, the probability of this is extremely small. Having many marine terminals and extensive vessel traffic in the Bay tends to increase the total amount of spill response equipment and services available.

All terminals and tanker/barge operators are required by federal and state regulations to demonstrate that they have, or have under contract, sufficient response assets to respond to worst-case releases. All terminals belong to a USCG and OSPR approved OSRO. These OSROs can provide all the necessary equipment and manpower to meet the requirements of existing regulations; however, oil spills can still result in significant, adverse impacts (Class I and Class II) to the environment depending on whether first response efforts can contain and cleanup the spill. Shore contributes incrementally to the cumulative environment.

Mitigation Measures for CUM-OS-2:

CUM-OS-2: Mitigation for Shore remains as described for the Proposed Project, measures OS-3 through OS-8.

Rationale for mitigation: Implementation of mitigation measures similar to OS-3 through OS-8 at all terminals would provide for increases in response capability and the lowering of the probability of accidents. However, each terminal would require individual evaluation of potential for impacts. These measures can reduce the consequences of small spills near a terminal that can be quickly contained and cleaned to less than significant. Shore contributes incrementally to the cumulative environment.

Residual Impacts: Even with mitigation applied, risk of oil spills, typically larger than 50 bbls, could result in environmental impacts that remain significant (Class I).

4.4.2 Water Quality

Impact CUM-WQ-1: Contaminants Impacts on Bay Water Quality

The water quality of the San Francisco Bay estuary has been degraded by inputs of pollutants from a variety of sources, as such, any contribution of a contaminant already at significantly high levels to the waters of San Francisco Bay would have a significant adverse impact at the cumulative level (Class I).

The water quality of the San Francisco Bay estuary has been degraded by inputs of pollutants from a variety of sources. Major sources of contaminants include municipal wastewater and industrial discharges and a variety of nonpoint sources such as urban and agricultural run-off; riverine inputs; dredging and dredge material disposal; marine vessel inputs; and inputs from air pollutants, spills, and accidents. In general, stormwater run-off is responsible for the greatest mass loadings of most contaminants (Davis et al. 2000). The sources of contaminants to the San Francisco Bay estuary and the levels of contaminants throughout the estuary are discussed in detail in Section 3.2.2.2. That section describes levels of many contaminants in the water column, in the sediments, and in the biota in the estuary that either exceed water quality objectives in the San Francisco Bay Basin Plan or are at levels known to have harmful effects on aquatic organisms. Table 4.3-8 lists contaminants of particular concern in the San Francisco estuary. Table 3.2-12, in Section 3.2.3, lists contaminants that are considered to have impaired water quality in Carquinez Strait and Suisun Bay. Any contribution of a contaminant already at significantly high levels to the waters of San Francisco Bay would have a significant adverse impact at the cumulative level (Class I). Any contribution of these contaminants from Shore Terminals operations would be a significant adverse cumulative impact (Class I). Of the contaminants listed as significantly elevated in Tables 3.2-12 and 4.3-8, operations at the Shore terminal would not contribute to pesticides or PCBs.

Table 4.3-8
Pollutants of Particular Concern in the Bay/Delta Estuary

Trace Elements	
Cadmium	Selenium
Copper	Silver
Mercury	Tin (Tributyl)
Nickel	
Organochlorines and Other Pesticides	
Chlordane and its metabolites	Polychlorinated biphenyls
DDT and its metabolites	Toxaphene
Petroleum Hydrocarbons	
Polynuclear Aromatic Hydrocarbons (PAHs)	
Acenaphthene	2, 6-Dimethylnaphthalene
Acenaphthylene	Fluoranthene
Anthracene	Fluorene
Benz(b)fluoranthene	1-Methylnaphthalene
Benz(k)fluoranthene	2-Methylnaphthalene
Benz(g, h, i)perylene	1-Methylphenanthrene
Benzo(a)pyrene	2-(4-morpholinyl)benzthiazole
Benzo(e)pyrene	Naphthalene
Benzo(a)anthracene	Phenanthrene
Benzthiazole	Pyrene
Chrysene	2, 3, 5-Trimethylphenanthrene
Dibenzo(a, h)anthracene	Indeno(1, 2, 3-c,d)pyrene
Source: Monroe and Kelly 1992.	

As discussed in Impact WQ-5 for the Proposed Project, tankers visiting Shore Terminals may have contributed to water contamination through use of anti-fouling paints. Anti-fouling paints are biocides that contain copper, sodium, zinc and TBT which are highly toxic. Detectable levels of TBT were found in recent samples of Shore Terminals' sediments (Table 3.2-17 in Section 3.2), but the concentrations were lower than in reference sediments in Carquinez Strait. As TBT is gradually phased out by 2008, Shore Terminals contribution to TBT in the project area will decrease. Because organotins are so toxic to marine organisms, any continued use of organotins by vessels in San Francisco Bay is a significant adverse cumulative impact (Class I). Shore Terminals-bound vessels contribute proportionately to this impact.

Operations at the Shore terminal would contribute other chemical contaminants including small quantities of metals and PAHs. Inputs from the terminal include segregated ballast waters, small leaks and spills of oil and product, some contaminants in vessel paint or sacrificial anodes, and cooling water. None of these inputs have been quantified, but such volumes of contaminant inputs associated with Shore terminal operations would be expected to be small compared to other sources in San Francisco Bay. The Bay's largest municipal discharger, the San Jose/Santa Clara Water Treatment Plant (WTP) located in the South Bay, discharges 133 mgd of treated municipal sewage. Furthermore, inputs from nonpoint sources, including the San Joaquin and Sacramento Rivers and urban run-off, far exceed the permitted point source discharges, especially in wet years.

Contaminants in stormwater run-off from the Shore terminal pier are unknown. Because of the small area of the pier as compared to the watersheds that contribute runoff to the Bay, the total stormwater emissions from the Shore marine terminal would be expected to be extremely small compared to the total emissions in all stormwater runoff to the Bay.

Similarly, the amount of petroleum contributed to Bay waters from chronic releases at the terminal is generally small. As discussed in Section 3.1.2.7, only one spill from the Shore wharf during the past 5 years has occurred. This spill consisted of the release of about 30 gallons of fuel oil from a loading arm that fell into the water.

Of the projects described in the cumulative environment scenario in Section 4.2, continued operations at Shore marine terminal would contribute most to the cumulative water quality impacts associated with marine terminals. These impacts include the risk of oil spills and contaminants associated with large vessels including the significant adverse impacts of TBT and exotic organisms in segregated ballast water discharges. Other facilities such as ports that receive visits by tankers also would contribute to the significant adverse impacts of TBT and exotic organisms in ballast water discharges (Class I impacts).

Projects that would involve large vessels such as the ferry projects would increase inputs associated with vessels. However, because ferries would not take on ballast in other ports they would not increase the release of exotic organisms in ballast water. In addition, ferries would be new and would not have TBT anti-fouling paint on their hulls. Therefore, ferries would not contribute to cumulative water quality impacts of TBT. The addition of large vessels to San Francisco Bay may slightly raise the risk of an oil spill from collision of a tanker with a ferry.

Projects that involve in-Bay construction such as the I-680 new bridge and retrofit project, the Carquinez Bridge replacement project, and channel deepening projects could temporarily degrade water quality in the project area by disturbing sediments during pier installation and dredging, and spills and leaks of contaminants into Bay waters from various construction activities. Any degradation of water quality during construction would be temporary. In the long run, channel deepening projects might improve water quality by reducing the risk of vessel accidents and reducing the resuspension of sediments from boat propellers.

Projects that involve development in undeveloped upland areas would add to the cumulative impacts of pollutants in urban run-off. Urban run-off is one of the most significant contributors of pollutants to San Francisco Bay.

Finally, several programs are in place to improve water quality in San Francisco Bay. The LTMS recently was implemented to regulate the discharge of dredged material in the Bay. The CALFED Bay Delta Program is seeking to improve conditions in the Bay and Delta. The Regional Water Quality Control Board is developing TMDLs for pollutants impairing San Francisco Bay. These programs will have a cumulative beneficial impact on water quality in the project area.

In summary, operation of the Shore marine terminal would contribute to the significant adverse cumulative levels of certain contaminants in the San Francisco Bay estuary. However, this contribution is extremely small compared to other sources, particularly runoff and municipal discharges.

<u>Mitigation Measures for CUM-WQ-1</u>:

CUM-WQ-1: Implement Proposed Project measures OS-3 through OS-8, WQ-3 and WQ-5.

<u>Rationale for mitigation</u>: Shore Terminals implementation of measures to decrease spill risk and increase response capability, combined with preparation of a SWPPP would help the terminal reduce its contribution of contaminants into the water. In the long-term, documentation of vessels using TBT or other metal-based anti-fouling paints would help to reduce water quality impacts.

<u>Residual Impacts</u>: Although Shore Terminals' may reduce it's contribution of pollutants to San Francisco Bay to less than significant, the cumulative impact of degraded water quality, especially from urban run-off, is expected to remain significant (Class I). The development of Total Maximum Daily Loads for priority pollutants by the RWQCB and the implementation of Bay-wide management practices to meet those loads will help to reduce cumulative significant adverse water quality impacts. Until the mandate prohibiting TBT use on shiphulls comes into effect in 2008, impacts of anti-fouling paints will remain significant (Class I).

Impact CUM-WQ-2: Segregated Ballast Water

Contribution of contaminants or exotic organisms from operations at the Shore terminal would be a significant adverse cumulative impact that cannot be mitigated to less than significant (Class I).

The discharge of segregated ballast water from vessels visiting the Shore marine terminal would contribute to the significant cumulative adverse impacts to water quality and biological resources from the introduction of toxic microorganisms and invasive macroorganisms to San Francisco Bay. No information is available on the volume of segregated ballast water discharged annually to San Francisco Bay by vessels associated with the Shore terminal. Because many of these organisms are so invasive even a small volume of discharge can have devastating effects that are not proportional to relative discharge volumes. The biological impacts of invasive species are discussed in detail in Section 3.3.

Mitigation Measures for CUM-WQ-2:

CUM-WQ-2: Implement Proposed Project measure WQ-2.

Rationale for mitigation: Adherence to this measure addresses procedures Shore must follow for tracking the compliance of the vessels visiting Shore Terminals for ballast water management. The measure is a tracking measure only, and does not reduce the level of impact, as the problem is a regional/Bay-wide problem.

Residual Impacts: Until a feasible system is developed kill organisms in ballast water, the discharge of ballast water to the Bay will remain significant (Class I).

Impact CUM-WQ-3: Oil Spills along Outer Coast

A major oil spill along the outer coast would have a significant adverse (Class I) cumulative impact on water quality. A spill along the outer coast would not be within Shore Terminals responsibility.

Contaminant levels on the outer coast generally do not exceed water quality objectives. Shore marine terminal tankering would not have a significant adverse impact on water quality on the outer coast, except in the event of a major oil spill. Section 4.3.1 above presents a discussion of cumulative oil spill risk. A major oil spill would have a significant adverse (Class I), cumulative effect on water quality.

Mitigation Measures for CUM-WQ-3:

CUM-WQ-3: Implement Proposed Project measure OS-8a.

Rationale for mitigation: The measure calls for Shore to participate in VTS upgrade evaluations as opportunities arise. Such participation may help to evaluate and guide improvements in the VTS system.

Residual Impacts: Impacts of large spills would remain significant (Class I).

4.4.3 Biological Resources

Impact CUM-BIO-1: Routine Operations

Operations at the Shore marine terminal could contribute to the cumulative adverse impacts to biological resources from the introduction of non-indigenous organisms. These potential impacts include competition, destabilization of the aquatic food web, accumulation of contaminants in the tissues of non-native prey species such as the Asian clam, and introduction of disease microorganisms or toxic algae. These are cumulatively significant adverse impacts (Class I) and Shore Terminals' contribution to the cumulative potential for introduction of non-indigenous species through ballast water discharges or hull fouling could be considerable.

Plankton

Plankton populations in the San Francisco Bay estuary have been subjected to cumulative impacts from decreases in freshwater outflow from the Delta, introduction of exotic species, and degradation of water quality from inputs of contaminants. Plankton may also be affected temporarily by operations such as dredging and marine construction which generate turbidity. However, turbidity would be localized in space and time. Turbidity impacts would only be cumulative if two or more major projects were generating large areas of turbidity within the same Bay at the same time. Of the projects on the cumulative projects list, only the channel deepening projects would be likely to create extensive turbidity and it is highly unlikely that more than one area of channel would be dredged at any one time.

Maintenance dredging near the Shore marine terminal generates limited turbidity once every three years and is not expected to contribute to cumulative impacts on plankton populations. Operations at the terminal would also not contribute to cumulative impacts on plankton from decreases in freshwater outflow. However, the discharge of segregated ballast water could contribute to impacts from introduction of exotic species. Voracious filter feeding by the introduced Asian clam, *Potamocorbula amurensis*, has contributed to marked declines in phytoplankton populations in the northern reach (especially in Suisun Bay). Introduced zooplankton species, such as the copepods *Sinocalanus doerri* and *Pseudodiaptomus forbesi*, are thought to have contributed to the declines of native species such as *Eurytemora affinis* and *Diaptomus* sp.

The cumulative impacts from the introduction of exotic species have been highly significant to the native plankton assemblages of the San Francisco estuary. Approximately 108 tanker calls per year are made to the Shore marine terminal. The average volume of ballast water discharged by a tanker is estimated to be 2.5 million gallons (Cohen 1998). Therefore, tankers calling at the Shore terminal may discharge as much as 270 million gallons of ballast water per year if each one discharged ballast water in San Francisco Bay. The total amount of ballast water discharged to San Francisco Bay in a year is estimated to be between 2.5 and 5 billion gallons. Therefore, if all the tankers visiting the Shore terminal discharged their ballast water into San Francisco Bay, tankers associated with Shore marine terminal could be responsible for as much as 5 to 10 percent of the annual ballast water discharge. The contribution of tankers that visit the Shore terminal to annual ballast water discharges therefore is not trivial. The potential to introduce additional exotic species to San Francisco Bay is a significant adverse cumulative impact. The cumulative impact of contaminants input to San Francisco Bay is adverse and significant (Class I).

The release of contaminants associated with the Shore marine terminal would contribute to degradation of water quality within the Bay. Levels of many contaminants in the water column, the sediments, and the biota of the San Francisco Bay estuary are at levels found to have harmful effects on aquatic organisms. It is not known if contaminant levels have affected plankton populations. Operations at the terminal would contribute slightly to the levels of these contaminants, but the terminal's contribution to mass loadings of these contaminants is much less than other sources, such as industrial discharges and storm run-off. Therefore, Shore Terminals' would contribute to the cumulative impacts of degradation of water quality on planktonic organisms, but that contribution would be small compared to other sources. The cumulative impact of contaminant input to San Francisco Bay is adverse and significant (Class I).

<u>Benthos</u>

Cumulative impacts on the benthos from routine operations could occur from disturbance of sediments in ship channels, and during dredging, introduction of exotic organisms in ballast water and inputs of contaminants in sediments.

Benthic invertebrate communities in the ship channels are marked by a lower abundance and diversity than communities in less disturbed areas. The depauperate communities in the shipping lanes are probably related to the frequent disturbance of the sediments by the wakes and propellers of large vessels, as well as by periodic maintenance dredging. Therefore, the disturbance to the shipping channels within San Francisco Bay has altered the diversity and abundance of benthic invertebrate populations and is a significant adverse impact (Class I). Tankers and barges traveling to and from the Shore marine terminal represent less than 1 percent of the annual vessel traffic in San Francisco Bay. Therefore, the contribution that operations at the Terminal make to impacts of navigation channels on benthic communities is small.

Operations at the Shore marine terminal could contribute to the introduction of exotic species if ballast water was discharged. The potential adverse impacts of invasive species, should any be introduced, could be highly significant and would occur in a vulnerable environment because of cumulative impacts from previous invasions and other disturbances (Class I). Furthermore, the Shore marine terminal's contribution to the annual volume of ballast water discharged in the Bay could be considerable.

Annual maintenance dredging would disturb the sediments at the dredge site near the terminal and at the Carquinez Strait disposal site. Dredging activities would contribute to the disturbance of benthic communities in these areas. Because dredging only affects the benthos in a limited area and because the volume of material dredged to maintain the Shore terminal berth is so small, the cumulative effect of maintenance dredging by Chevron on benthic communities would be adverse but less than significant (Class III). Shore Terminals' contribution to the annual discharge at the Carquinez Strait site is less than 0.05 percent.

Sediments in San Francisco Bay exceed levels at which effects to benthic organisms can occur in many locations. Contaminants in sediments may be contributing to the degraded condition of benthic communities within San Francisco Bay. The San Francisco Estuary Institute recently conducted a pilot study to identify the degree of contaminant impacts to benthic assemblages in the San Francisco estuary (Lowe and Thompson 1999). The benthic assessments identified two samples from Stege Marsh in the eastern Central Bay that were severely contaminated and showed that several San Leandro Bay samples were considered to be moderately affected by contamination. Most benthic assemblages in the study area did not appear to be highly degraded by contamination. Therefore, the cumulative impacts of contamination on benthic populations in San Francisco Bay appear to be significant only in localized areas. The effects of chronic contamination from terminal operations to cumulative impacts of contamination on benthic communities in San Francisco Bay are adverse but less than significant (Class III).

<u>Fishes</u>

The fish populations in the San Francisco Bay estuary have been altered by the cumulative impacts of overfishing, loss of habitat, introduction of exotic species, decreased Delta outflows, and increases in contaminants (Nichols et al. 1986). Of these major factors affecting fish populations in the Bay, operation of the Shore marine terminal would contribute directly to increases in exotic species and contaminants. Moreover, any stresses on fish populations as a result of terminal operations would affect fish populations already stressed by the other factors. Operations at the terminal would also contribute to the cumulative impacts of maintenance dredging and vessel noise on fish populations. The cumulative impacts of these activities appear to be minor. As discussed in Section 3.3.3.2, noise from large vessels can startle fishes and cause avoidance behavior. Within the San Francisco Bay estuary, with its constant background of vessel noise, fishes have probably adapted to the regular noise of large vessels (Class III impact). Fishes have been documented to avoid dredge disposal areas during disposal events. The area affected is small, however, and disposal events occur during a brief time period. On a cumulative level, dredging and dredge material disposal would have an adverse but less than significant impact on fishes (Class III).

The evidence suggests that contaminant loads may be significantly affecting fish populations in San Francisco Bay. Fishes within the San Francisco Bay estuary have been documented to show liver abnormalities which are thought to be related to elevated levels of contaminants (San Francisco Bay Estuary Project 1992). Recent studies of contaminant levels in fishes in San Francisco Bay showed that fishes collected in 1994 and 1997 had very high levels of several contaminants, including mercury, PCBs, dieldren, DDT, and chlordane (Davis et al. 1999). None of these contaminants is likely to be associated with operations of the Shore marine terminal.

Pollutants have been implicated in the decline of the striped bass (Whipple et al. 1987). As discussed in Section 3.3.3, operations at the terminal may be contributing small quantities of contaminants to add to pollutant stresses on fishes in the San Francisco Bay estuary. The terminal's contribution to contaminant loads is extremely small relative to other sources. While this contaminant input by itself would present a small yet significant adverse impact on fishes of the San Francisco Estuary (Class I), the overall contaminant loading to the Estuary from all sources is substantial and will significantly affect the fish populations of San Francisco Bay.

Operations at the Chevron marine terminal could contribute to the cumulative adverse impacts to fishes from the introduction of non-indigenous species. These potential impacts include competition from non-native fishes, destabilization of the aquatic food web, accumulation of contaminants in the tissues of non-native prey species such as the Asian clam, and introduction of disease microorganisms or toxic algae. These impacts are cumulatively and adversely significant (Class I) and Shore Terminals' contribution to the cumulative potential for introduction of non-indigenous species through ballast water discharges or hull fouling could be considerable.

Marshes

Marshes in the San Francisco Bay estuary have been lost and severely degraded by diking, filling, flood control, and the indirect impacts of development. Routine operations at the Shore marine terminal would not contribute to cumulative impacts on saltmarsh habitat.

Avifauna

Routine operations of the Shore marine terminal would produce noise and human activity, and some discharges affecting local water quality. To some extent, all of these factors influence the distribution and present patterns of abundance of seabirds, shorebirds, and waterfowl. Typically, birds common near marine terminals are those most tolerant of noise and human activity. These include nesting western gulls, several other species of gulls that roost on or near marine terminals, occasionally brown pelicans, blackbirds, and other passerines.

Scoters and ducks typically forage or rest in the shallow waters of the Bays rather than in deeper waters. They are uncommon in the fast currents of the ship channel and are not likely to be affected by slow-moving tanker traffic. They are low in abundance in the immediate vicinity of all marine terminals. The few present would not be subject to mortality or habitat loss due to normal activities associated with vessel calls and transfer of oil or petroleum products. Although routine operations could produce adverse impacts, these would be less than significant because of the small number of birds that might be affected (Class III).

Discharges from marine terminals may affect local water quality, ultimately contributing to deterioration in habitat and contamination of fish and invertebrate food resources consumed by birds. These discharges, like those of other industrial activities in the

Bays, are regulated by the RWQCB. Pollutants found in especially high concentrations in scoters and ducks include selenium, silver, copper, mercury, zinc, and cadmium. These metals are contained in the mussels, clams, and other benthic organisms consumed by waterfowl, and are the accumulation of many years of discharges from a variety of sources. The cumulative impact of contaminant discharges on avifauna is considered a significant adverse impact (Class I). However, the Shore Terminals' contribution to cumulative contaminant levels in San Francisco Bay is extremely small.

Operations at the Shore terminal could contribute to the cumulative adverse impacts to water-associated birds from the introduction of non-indigenous species. These potential impacts include destabilization of the aquatic food web, accumulation of contaminants in the tissues of non-native prey species such as the Asian clam, and introduction of disease microorganisms or toxic algae. These impacts are cumulatively significant (Class I) and Shore Terminals' contribution to the cumulative potential for introduction of non-indigenous species through ballast water discharges or hull fouling could be considerable.

Marine Mammals

The possibility exists for injury or death of sea lions, harbor seals or harbor porpoises due to collisions with vessels. If impacts occurred, they would be significant because both species are protected under the Marine Mammal Protection Act of 1972. Instances of collisions of large vessels with these agile marine mammals are extremely rare. It is unlikely that a sea lion, harbor seal or harbor porpoise would be struck by a slow-moving tanker. Because of the negligible chance of occurrence, the impacts of collision with the marine mammals in the Bays from normal vessel traffic would be less than significant (Class III). Marine mammals within San Francisco Bay are adapted to activity and vessel traffic. The cumulative impacts of disturbance to these species from vessel traffic and in-water construction would be adverse but less than significant (Class III).

Rare/Threatened/Endangered Species

Chinook salmon are found in the immediate vicinity of the Shore marine terminal. Contaminants associated with the terminal are unlikely to contribute to the body burden of young salmon, because individuals would only remain near the terminal for a short while before they migrate to the ocean. Because salmon spend their adult lives off the open coast, they are not subjected to the high level of contaminants in San Francisco Bay for more than a short while; therefore, the cumulative impact of contaminants on Chinook salmon would be adverse but less than significant (Class III). Dredging operations at the Shore marine terminal or elsewhere in the Bay could interfere with the movement of young salmon from the Delta to the ocean. Interference with the out migration of young salmon is a potentially adverse and significant impact (Class II). Impacts could be reduced to less than significant by restricting dredging to July and August when winter and spring run smolt activity is lowest.

No rare, threatened, or endangered bird species typically occur in the immediate vicinity of marine terminals in the Bay, except for the California brown pelican (federal and state endangered), which uses the San Francisco Bay estuary in late summer and fall. California brown pelicans are known to roost in small numbers at sites throughout the area (generally pilings and breakwaters at some distance from sources of disturbance). Sites near marine terminals used for roosting by substantial numbers of birds include the Brothers Rocks off the PAKTANK Terminal, the Brooks Island breakwater off the Port of Richmond, and the Alameda NAS breakwater off the Ports of Oakland/Alameda. Presumably, pelicans roosting near marine terminals are accustomed to noise and activity from routine operations; therefore, any impacts would be minor and less than significant (Class III).

Endangered least terns have an important colony at the Alameda NAS. This colony has nested successfully in recent years in spite of high vessel activity in the area. Alameda NAS is not near the Shore marine terminal and routine operations at the terminal would not affect this colony (Class III – less than significant). A smaller least tern colony is located closer to the Shore terminal at Pittsburgh. This colony is sufficiently distant from Shore that operations at the terminal would not disturb the colony.

Several California Species of Special Concern may be seen near marine terminals. These include double-crested cormorants, long-billed curlews, California gulls, some ducks, several species of foraging raptors (Order Falconiformes), the black swift, and several species of passerines (perching birds of the Order Passeriformes). None of these species is likely to be disturbed by marine terminal operations. Double-crested cormorants have an important colony on the Richmond-San Rafael Bridge near the Chevron Richmond marine terminal. A study determined that the reproductive success of this colony was similar to that of double-crested cormorant colonies in undisturbed areas (Stenzel et al. 1991). Numbers at this colony are increasing; therefore, impacts on double-crested cormorants probably would be less than significant from operations (Class III).

Operations at the Shore marine terminal could contribute to the cumulative adverse impacts to sensitive species from the introduction of non-indigenous organisms. These potential impacts include competition, destabilization of the aquatic food web, accumulation of contaminants in the tissues of non-native prey species such as the Asian clam, and introduction of disease microorganisms or toxic algae. These are cumulatively significant adverse impacts (Class I) and Shore Terminals' contribution to the cumulative potential for introduction of non-indigenous species through ballast water discharges or hull fouling could be considerable.

<u>Mitigation Measures for CUM-BIO-1</u>:

CUM-BIO-1: Shore Terminals shall implement Proposed Project measure WQ-2.

<u>Rationale for Mitigation</u>: Implementation of the measure addresses requirements for Shore Terminals to track vessel compliance with ballast water management. However, effective systems for the treatment of ballast water to remove harmful organisms have not yet been developed.

Residual Impacts: Cumulative biological impacts in San Francisco Estuary would remain adverse and significant (Class I) but Shore Terminals' contribution to most impacts to biological resources is small compared to other sources.

Impact CUM-BIO-2: Accident Conditions

Oil spills from all terminals combined, or from all tankering combined, may affect more resources than Shore Terminals' operations alone, due to the wider distribution of potential sources of spills. Operations solely associated with Shore Terminals contribute relatively little to the cumulative risk of an oil spill. Even so, a spill from Shore Terminal operations has the potential to impact biological resources and result in a significant adverse (Class I or II) impact.

Probability of Impacts

Cumulative conditions produce a greater threat that oil spills will occur than the risk from operations at the Shore terminal alone, because of the greater quantities of oil handled or transported, and the greater number of vessel calls. Further, oil spills from all terminals combined, or from all tanker segments combined, may affect more resources than Shore Terminals' operations alone, simply due to the wider distribution of potential sources of spills. Based on the analysis in the Unocal EIR, Table 4.3-9 shows the final probability of oil spills occurring and contacting sensitive habitat from the cumulative, or combined, activities of all marine terminals and tanker transport. The potential for impacts is many times greater from cumulative terminals and tankers than from Shore Terminals' operations alone. For most resources the chance is at least 50 percent that they would be affected by one or more spills of 1,000 bbls or greater during the next 40 years. For some resources, the risk that they would be contacted by a small spill is near certainty. For spills of 10,000 bbls or more, the chance ranges from about 13 to 45 percent for impacts from one or more spills during the next 40 years. Along the outer coast, the probability that a resource would be contacted by oil from a tanker spill is much greater if all tankers are considered rather than Shore Terminals' tankers alone. The cumulative probability that widely distributed species like double-crested cormorant colonies would be contacted by a 1,000- to 10,000-bbl spill from a tanker off the outer coast is about 60 percent.

Although the overall absolute probability that some portion of a resource would be contacted by a spill during the lease period is higher when the cumulative impact of all terminals and tankers is considered compared to activities at the Shore marine terminal alone, the relative risk generally does not change. The relative risk considers the percentage of a resource that has a high probability of being oiled should a spill occur. Thus, there is a much higher chance for most resources that they would have some contact with oil from some spill during the next 40 years when all terminal and tankering activities are considered, but once a spill has occurred the risk that a substantial portion of the resource would be contacted by oil does not change.

Table 4.3-9
Final Probabilities of Oil Spills Occurring and Contacting Sensitive Populations or Habitat within a 40-Year Period from the Cumulative or Combined Activities of all Marine Terminals and Tanker Transport

Sensitive Habitat	Final Probabilities[1] (percent) Cumulative Barrels	
	>1,000	>10,000
San Francisco, San Pablo, and Suisun Bay		
Birds		
shorebirds – mudflat foraging habitat	73.2	23.0
waterfowl – open-water habitat	73.2	23.0
western gull – colony sites	97.6	44.2
Marine Mammals		
harbor seal – haulout sites	74.4	30.2
Fishes		
white sturgeon habitat	26.0	4.6
Chinook salmon habitat	96.5	44.8
American shad habitat	99.9	45.4
herring spawning areas	99.5	45.5
Invertebrates		
juvenile Dungeness crab (April-May)	99.9	45.5
juvenile Dungeness crab (September-December)	99.9	45.5
Other Sensitive Habitats		
eelgrass bed	92.7	40.5
vegetated tidal marshes	99.9	45.5
shallow water habitat	99.9	45.5
Rare/Threatened/Endangered Species		
California clapper rail and California black rail – breeding habitat	48.4	19.1
California least tern – colonies	42.6	13.1
double-crested cormorant –		
colony sites	84.7	33.9
open-water habitat	99.9	45.5
common loon – winter open-water habitat	50.0	22.7
long-billed curlew – mudflat foraging habitat	73.2	23.0
brown pelican – roosts	48.5	15.4
Barrow's goldeneye – open water habitat	73.2	23.0
Aleutian Canada goose – open water habitat	48.5	15.5
	99.9	45.5
Outer Coast		
Birds		
alcid colonies	17.7	8.0
storm-petrel colonies	6.2	2.8
cormorant colonies	60.9	27.5
western gull colonies	61.6	27.8
Marine Mammals		
harbor seal – haulout sites, 50 seals	30.8	13.9
California sea lion – haulout sites	28.0	12.6
northern elephant seal – colonies	7.3	3.3
dolphin and porpoise – open-water habitat	62.0	28.0
gray whale migration path	57.7	26.0

Table 4.3-9 (Continued)
Final Probabilities of Oil Spills Occurring and Contacting Sensitive Populations or Habitat within a 40-Year Period from the Cumulative or Combined Activities of all Marine Terminals and Tanker Transport

Sensitive Habitat	Final Probabilities[1] (percent) Cumulative Barrels	
	>1,000	>10,000
San Francisco, San Pablo, and Suisun Bay		
Other Sensitive Habitats		
Areas of Special Biological Significance (ASBS)	53.6	23.8
salmon streams/rivers	25.2	11.2
rocky shore and offshore rocks	61.9	27.5
estuaries	3.7	1.6
upwelling areas – February through July	31.1	13.8
Rare/Threatened/Endangered Species		
common loon – nearshore waters	30.9	13.7
California brown pelican – roosts >100 birds	13.6	6.2
Steller sea lion – rookeries and haulouts	12.5	5.7
blue/fin/humpback whales – Gulf of Farallones habitat	20.5	9.2
sea otter range – north of Monterey Bay	14.3	6.4

[1] **Final probability is the product of the probability that an oil spill will occur and the probability that, if it occurs, it would contact a particular sensitive resource. Final probability is multiplied by proportion of year sensitive resource is present.**

Although the probability of contact by oil spills is greater for cumulative conditions, the severity of impacts of individual oil spills is of the same scale as for the Shore marine terminal. The reasonable worst-case spill scenarios used above to describe potential impacts from the Shore terminal activities apply as well to impacts that would likely occur from cumulative terminals or tanker transport.

As discussed in Section 4.3.1, the annual probability of spills from the Shore marine terminal accounts for approximately less than 1 percent of the overall probability of spills from marine terminals within the Bay. Based on the estimated mileage traveled within the Bay, vessel traffic associated with the Shore marine terminal accounts for approximately 5 percent of the total probability of a spill from tanker and tank barge traffic in the Bay. Therefore, operations associated with the Shore marine terminal contribute relatively little to the cumulative risk of an oil spill. For the biological resources of San Francisco Bay, the worst situation would be if two or more oil spills occurred within a short time. In this worst-case situation, the total percentage of a sensitive resource affected by oil might be substantially greater than if spills occurred infrequently enough that recovery occurred between spills. The analysis in Section 4.3.1 indicates that the mean time between spills of 238 bbls or greater was 36 years or more. Therefore, it is unlikely that resources would be contacted by more than one oil spill during the 20-year life of the lease.

Mitigation Measures for CUM-BIO-2:

CUM-BIO-2: Shore Terminals shall implement Proposed Project measures OS-3 through OS-6 and BIO-6.

Rationale for Mitigation: The measures OS-3 through OS-6 increase response capability and reduce accident risk. In addition the measures require that Shore Terminals increase boom, provide access to sonic devices to scare birds away from a spill, and consultation for cleanup actions with CDFG and USFWS will avoid damage that could occur during cleanup operations. Documentation of damage from oil spills would also provide data to determine the effectiveness of a cleanup and to help determine any necessary compensation. These measures help to reduce oil spill impacts to biological resources. For small spills of less than 50 bbls, impacts to biological resources can be reduced to less than significant.

Residual Impacts: Cumulative biological impacts in San Francisco Estuary would remain adverse and significant but Shore Terminals' contribution to most impacts to biological resources is small compared to other sources. Impacts from large spills would remain significant (Class I).

4.4.4 Commercial and Sports Fisheries

This cumulative impact analysis considers effects from past, present, and identified future oil and non-oil related development on fishing operations in the Bay Estuary and on fishing, kelp harvesting and aquaculture operations along the outer coast. The analysis takes into consideration cumulative terminal operations and vessel traffic for both the Bay and the outer coast. The analysis is based on information in Section 4.2 General Description of Cumulative Environment and Section 4.3 Regional Characteristics of Crude/Product Transportation in Bay and Along Coastal Shipping Lanes Off Northern California. Chambers Group (1994) (Section 4.5.4) generally describes the causes of cumulative impacts.

The projects included in the cumulative impacts scenario reflect increased industrialization and urbanization in and near the Bay Estuary. Long-term degradation of the Estuary will likely be exacerbated by the projects included in the cumulative impacts scenario and continuation of operations at Shores Terminals. To offset some of these long-term effects, intense efforts are underway to restore the Estuary and Bay-Delta watershed. Restoration of fish habitat in the North Bay, South Bay, Suisun Marsh and elsewhere in the watershed is increasing in response to listing of species as threatened and/or endangered. Also, negotiations over increasing water flows from upstream water developments and diversions in the rivers and Delta are on going. If these efforts are successful in, at a minimum, arresting the degradation or at best, enhancing habitat and populations, beneficial effects to fish and habitat may be seen in 10 to 20 years.

Another effect of increased urbanization may be an increased interest in the Estuary as a fishery. Together with the attention focused on restoration and enhancement, sport fishing activities may increase. If demand increases, agencies and stewards will have the continued responsibility to ensure sustainability of the resource.

Impact CUM FSH-1: Space Use Conflicts on Herring and Shrimp Fisheries

The cumulative projects result in space use conflicts on the Pacific herring fishery and sports fishing near the Shore terminal and between shrimp operations and shipping activities in the Carquinez Strait result in significant adverse (Class I and II) impacts. Shore Terminals contribution to space use conflicts is less than significant (Class III) on the shrimp and herring fisheries at the terminal, but significant (Class II) in Carquinez Strait.

Operations at Shore Terminals would continue in conjunction with operations at other marine terminals, navigation improvement projects (including dredging of shipping channels), bridge improvement projects, conversion of former military installations, land based projects, and new ferry service. Some of these projects are located near the Shore marine terminal.

<u>Routine Operations at Shore Terminals</u>

Space use conflicts between the Pacific herring fishery and commercial and industrial activities in Bay harbors and at shipping terminals would continue and vary depending on the location and size of the fishing area and the level of disturbance from future development. For example, the new ferry service and improvements to the San Francisco Bay Bridge may disturb or preclude herring spawning, and thus the fishery. Shore Terminals' contribution to impacts would be negligible, since no herring fishing occurs near the terminal.

Sport fishing activities would continue throughout the Bay and the new developments in the Bay may further preclude sport fishing activities. On the other hand several projects may enhance opportunities. As examples, the Ferry Point Pier and Terminal and Point Molate Reuse projects may provide new fishing access and new marinas. Depending on location and the mitigation measures, significant adverse space use impacts would either be reduced to less than significant (Class II) or would remain significant (Class I). Shore Terminals' contribution to the impacts would be less than significant (Class III).

<u>Routine Operations in the Bay</u>

Vessel calls at the Shore terminal currently average 182 and could increase to 240 to 325 vessels over the next 20 years. Throughout the Bay Estuary, in 2000 at total of 23,088 vessels called at local terminals. Of these, 2,544 called at terminals in or near the Carquinez Strait. Currently, the Shore marine terminals portion of vessel traffic to and in the Bay Estuary ranges from less than 1 percent of total vessel calls to Bay terminals to 7.2 percent of calls in or near the Carquinez Strait.

Space use conflicts from shipping activities would continue. Marine vessels transiting to the Carquinez Straits, Suisan Bay, Ports of San Francisco, Oakland and Richmond and other harbors would continue to use the established shipping channels. Use of the channels would continue to preclude access to fishing areas, but also serve to concentrate traffic so that other areas would be available for fishing. Nevertheless, vessels servicing Shore Terminals and other terminals in or east of the Carquinez Strait would continue to conflict with shrimp operations in the Strait. Throughout the Estuary, Shore Terminals contribution to space use conflicts is small, but adverse, ranging from Class III on sport fisheries, Class II on the shrimp fishery and Class II to III on the herring fishery.

<u>Routine Operations along the Outer Coast</u>

Cumulative impacts on fisheries along the coast may be significant as a result of future development, ocean dumping, additional pollution from increased onshore and offshore development, dredging, and other activities. Impacts from routine tankering make a small contribution to cumulative impacts on fisheries along the coast. As a result, impacts from vessels servicing Shore Terminals are expected to be less than significant (Class III).

<u>Mitigation Measures for CUM-FSH-1</u>:

CUM-FSH-1: Shore Terminals shall implement Proposed Project measure FSH-4.

<u>Rationale for mitigation</u>: This measure requires Shore to notify the shrimp trawlers operating in Carquinez Strait of increases in vessel transits associated with Shore operations and notify terminal-bound incoming vessel operators of the trawling activities. The mitigation reduces the potential for impacts associated with Shore operations. Shore has no responsibility for other vessels transiting the Carquinez Strait. Impacts associated with Shore operations would be reduced to less than significant. The measure may also serve to reduce the potential for cumulative space use conflicts, but the extent of reduction is unknown.

Impact CUM-FSH-2: Benthic Communities, Fish and Fish Habitat

Frequent disturbance of sediments by passing vessels results in a lower abundance and diversity of benthic communities and commercial and sports fisheries and result in significant adverse (Class I) impacts. Shore contributes incrementally to this impact, but is less than significant (Class III).

Benthic invertebrate communities in ship channels suffer lower abundance and diversity than communities in less disturbed areas (Biological Resources Section 4.3.3.1). These conditions are likely caused by frequent disturbance of sediments by wakes, ship propellers and dredging and amount to a significant adverse impact (Class I) on sport and commercial fisheries. In addition, several shipping channels, including the John F. Baldwin, Suisun Bay, and Southampton Shoal channels may be deepened to accommodate larger vessels, exacerbating the degradation of habitat. Shore Terminals dredging program does not contribute adversely to this impact. Vessels in route to Shore Terminals contributes incrementally to the impact.

<u>CUM-FSH-2: No mitigation is required.</u>

Impact CUM-FSH-3: Contaminant Impacts on Benthic Communities, Fish and Fish Habitat

Water quality degradation due to ballast water discharges, stormwater run-off, and anti-fouling paints on vessels effect plankton and fishes and result in significant adverse (Class I) impacts. Shore's contribution to this considered significant (Class I).

Impacts on fish and habitat (plankton, benthos and fishes) from ballast water discharges at marine terminals and ports in the Bay are expected to be significant (Class I), according to Biological Resources Section 4.3.3.1. The contribution by vessels servicing Shore Terminals is substantial. Fish and habitat impacts are also expected from contaminants, including stormwater run-off and anti-fouling paints on vessel hulls. Effects on plankton and fishes from contaminants are expected to be significant adverse impacts (Class I).

<u>Mitigation Measures for CUM-FSH-3</u>:

CUM-FSH-3: Implement Proposed Project measures WQ-2 and WQ-7.

<u>Rationale for mitigation</u>: The measures require Shore to prepare comply with ballast water tracking measures, and prepare a SWPPP implementing BMPs to control stormwater runoff. Control of contaminants from run-off from the terminal can be reduced to less than significant.

<u>Residual Impacts</u>: Impacts associated with ballast water discharge remain significant (Class I) for Shore Terminals and cumulative projects until a Bay-wide program is established to kill organisms in ballast water.

Impact CUM-FHS-4: Accidents Conditions

Cumulative impacts on fisheries from oil spills from harbor and shipping activities throughout the Bay, including impacts from Shore Terminals and related tankering, would range from Class I to Class III. Except for the area near the terminal, Shore Terminals has no responsibility for vessels transiting the Bay or outer coast.

Generally, areas at highest risk from terminal spills in the Bay (all terminals, including the Shore terminal) are in the Carquinez Strait, southern Suisun Bay and near shore areas from Point San Pablo to Richmond. In addition, portions of the central Bay are at risk. Tankering in the Bay has the potential to result in a greater geographical spread of oil. Generally, high risks would occur from the Carquinez Strait through eastern

San Pablo Bay, into San Francisco Bay south to Alameda, and west to the Golden Gate. Fisheries in the central portion of the Bay (off San Francisco, Oakland, and Tiburon) are at an extremely high risk of contact with spilled oil (30 to 39 percent) and would result in significant, adverse (Class I) impacts. Greater detail on the fisheries at highest risk can be found in Chambers Group (1994), Section 4.5.4.

Impacts from coastal oil spills would likely be significant adverse (Class I) impacts, and similar to those described in Section 3.4.3.4 (accidents along the outer coast related to the Proposed Project). Vessels calling at Shore Terminals contribute incrementally to the risk from vessels traversing the coast. The 182 vessels calling at the Shores terminal constitute between 5 and 6 percent of the coast wide vessel trips that access San Francisco Bay, and the number of calls may increase to as many as 325 calls per year. The number of vessels transiting through the Golden Gate ranges from 3,142 according to the Marine Exchange and 3,797, according to the Army Corps of Engineers (refer to Tables 4.3-1 and 4.3-2). Risks to fisheries, aquaculture and kelp harvesting operations from vessels calling at the Shore terminal would likely be similar to those assessed by Chambers Group (1994), and would likely be significant (Class I).

Oil spill risk and resulting cumulative impacts of oil spills from the Shore terminal operations and other vessel activities would likely result in significant, adverse (Class I) impacts at local terminals, in the Bay, and along the outer coast.

<u>Mitigation Measures for CUM-FSH-4</u>:

CUM-FSH-4: Implement Proposed Project measure FSH-8.

<u>Rationale for mitigation</u>: The measures that comprise FSH-8 would minimize the areas precluded to fishing during a spill and subsequent cleanup, and help to offset the losses to fishing interests and businesses depending on fishing activities. Containment of small spills and protection of resources may reduce impacts to less than significant for small spills for Shore-related operations near the terminal. Shore would have no responsibility for spills from vessels transiting the Bay or outer coast.

<u>Residual Impacts</u>: Impacts would remain significant (Class I) for large spills near the Shore Terminal from Shore-related operations.

4.4.5 <u>Land Use and Recreation</u>

Impact CUM-LU-1: Oil Spills from Vessels in Transit in Bay or along Outer Coast

Impacts to sensitive shoreline lands, and/or water and non-water recreation due to a release of oil would result in potentially significant adverse (Class I or II) impacts. When the cumulative environment is considered, the contribution from Shore Terminals is small, but still a spill could be significant (Class I or II).

No impacts from Shore's routine operations would contribute to impacts to the cumulative environment. The Proposed Project and other projects in the region have the risk of a potentially significant oil spill. Over the 20-year lease period, increased throughput would occur through an increase in the number of vessels handled at the wharf. An incremental increase in spill risk and oil spill risks to land uses and recreational uses would be associated with that increase. When the cumulative environment is considered, the contribution from the Proposed Project is small. Even so, impacts to sensitive shoreline lands, and/or water and non-water recreation due to a release of oil would remain potentially significant (Class I). Shore would be responsible for spills at or near the terminal, but not for vessels transiting and Bay or outer coast.

Mitigation Measures for CUM-LU-1:

CUM-LU-1: Mitigation for accidents in the shipping lanes would not be Shore Terminals responsibility. Shore Terminals shall implement measures OS-8a and OS-8b in Operational Safety/Risk of Upset.

Rationale for mitigation: Response capability for containment and cleanup of land oiled areas is not the responsibility of Shore for shipping lane accidents except near the terminal. However, Shore may participate in VTS upgrade evaluations and response actions near the terminal to help reduce potential impacts to shoreline and recreational areas. Each marine terminal within the Bay Area is also responsible for minimizing spill risks at their facility. Impacts near the Shore terminal may be reduced to less than significant.

Residual Impacts: Impacts could remain significant (Class I).

4.4.6 Air Quality

Impact CUM-AQ-1: Cumulative Air Quality Emissions

Cumulative projects in the region contribute to cumulative emissions in the region. Shore Terminals contribution to the overall air quality emissions is less than significant (Class III).

The Proposed Project and other projects in the region will continue to generate air emissions over the life of the lease and thereby contribute to cumulative emissions within the region. At the level of current operations, Shore marine terminal emissions are within the existing baseline conditions and will not contribute additional emissions to the cumulative impact. The potential future increase in operations could result in potentially significant adverse impacts that would be reduced to a level of less than significant (Class III) through the use of improved technology and BAAQMD requirements.

CUM-AQ-1: No mitigation is required.

4.4.7 <u>Noise</u>

Impact CUM-N-1: Cumulative Noise

Cumulative projects in the region comprise the ambient noise environment throughout the Bay area. Shore Terminals continued operations, even with increases in operations over the lease period would result in less than significant (Class III) noise impacts to the cumulative environment.

As currently operated, the Shore terminal noise impacts are included in the existing baseline conditions and will therefore not contribute additional noise to the cumulative impact. In addition, because noise is generally a localized issue, the contribution to the cumulative environmental more typically occurs when two or more facilities generate noise levels that individually and cumulatively exceed local noise ordinances. Potential future operations, including increased marine vessel calls at the Shore marine terminal over the 20-year term of the proposed lease, would potentially increase the cumulative noise impacts within the region due primarily to increased vessel traffic and encroaching land development near the Shore Facility. In 2000, there were 2,544 vessel calls through the Carquinez Strait, including 320 tankers (Corps 2000). Potentially increasing annual vessel calls at the Shore marine terminal up to 325 vessels represents a 3 percent increase in the number of vessels traveling through the Carquinez Strait. It should also be noted that only one vessel can call on the marine terminal at any one time. Based on this incremental increase in the number of vessels traveling within the Carquinez Strait, the Shore terminal would contribute less than significantly (Class III) to the cumulative impact.

<u>CUM-N-1: No mitigation is required.</u>

4.4.8 <u>Vehicular and Rail Transportation</u>

Impact CUM-TR-1: Local and Regional Vehicular Traffic

Cumulative traffic in the Bay area would be expected to increase significantly over the long term. Shore Terminals' contribution to local and regional vehicular traffic would be less than significant (Class III).

Over the 20-year lease period, an increase in traffic along Waterfront Road can be expected, however, unless land uses change from the industrial or intensify, a substantial increase on this roadway segment is not foreseen. Over the lease period, Shore may increase tank storage in the upland area. Any increase in vehicular activity would be associated with the upland operations and not the wharf. An increase in upland operations would be foreseen as less than significant. Shore's marine terminal would not contribute to cumulative vehicular impacts since there would be no increase in traffic from wharf operations, and is thus less than significant (Class III). Rail is not foreseen as a use by Shore during the lease period.

<u>CUM-TR-1: No mitigation is required.</u>

4.4.9 Visual Resources/Light and Glare

Impact CUM-VR-1: Visual Effects of Cumulative Tanker Activities

The Bay area vessel movements comprise a large number of tankers, ships, barges, sport and other vessels that are everyday occurrences in the visual environment. Low level lighting associated with marine terminals does not result in light or glare impacts. Expectations of the public with respect to cumulative tanker operations associated with routine operations are considered to be a less than significant impact (Class III).

Tanker movements throughout Carquinez Strait and into Suisun Bay are part of an established pattern of activity that has occurred and will continue to occur over the next 20 years. The Shore marine terminal and related tanker movements through the Bay and into Carquinez Strait and Suisun Bay contribute to that activity. These vessel movements are an acceptable visual action. Low level lighting from marine terminals typically is distant from receptors and does not result in light and glare impacts to nearby land uses. The expectations of the public of the cumulative environment would not result in significant adverse changes and impacts are considered to be less than significant (Class III).

CUM-VR-1: No mitigation is required.

Impact CUM-VR-2: Visual Effect from Accidental Release of Oil

Spills from multiple sources that would overlap in time (either the spill occurrence or cleanup operation) is unlikely, however, such incidents would result in significant adverse visual impacts (Class I or II).

A spill can begin as a very localized incident having the potential to spread over a very large area. While multiple spills are unlikely, if more than one spill would occur within a very short timeframe within the Carquinez Strait, Suisun Bay, San Pablo Bay or along the outer coast, significant adverse visual impacts (Class I or II) could result, depending on the adequacy of first response clean up efforts.

Mitigation Measures for CUM-VR-2:

CUM-VR-2: Mitigation for Shore includes adherence to those measures presented in Operational Safety/Risk of Upset and Biological Resources.

Rationale for mitigation: Those measures provide improved oil spill capabilities, oil spill containment measures and protection of resources. With implementation of those measures the risk to the visual environment can be reduced to less than significant for small spills. Each marine terminal within the Bay Area is also responsible for minimizing spill risks at their facility.

Residual Impacts: Impacts to the cumulative visual environment could remain significant (Class I) for large spills.

4.4.10 Cultural Resources

Impact CUM-CR-1: Sensitive resources exist in the Bay area and could be impacted by new construction or modification to existing facilities in areas that are previously undisturbed. Shore Terminals would not contribute adversely (Class III) to prehistoric or historic resources.

Given the overall sensitivity of the greater Bay area to contain cultural resources, the cumulative projects identified within the area have the potential to result in significant, adverse impacts (Class II) to cultural resources. The Shore marine terminal would not contribute to any disturbances of prehistoric or historic resources within the cumulative environment. Each project would require investigation into the extent of resources, impacts, and design of mitigation for that specific project.

CUM-CR-1: No mitigation is required.

4.4.11 Geological Resources/Structural Integrity Review

Impact CUM-GEO-1: Impacts of seismic forces on cumulative marine terminal facilities.

Wharves are supposed to be constructed to withstand large lateral forces, thus are not expected to have significant damage from earthquake events. No adverse cumulative impacts would result (Class III). Cumulatively, if many pipelines were to rupture and leak oil or product significant adverse impacts to the surrounding environment (Class I or II) could occur.

The shoreline of San Francisco Bay, Carquinez Strait and Suisun Bay is home to many marine and industrial facilities that are susceptible to earthquake-related damage. The 1989 Loma Prieta earthquake caused extensive damage to various structures in the city of Oakland and its port facilities (Benuska 1991; Borchardt 1991). Liquefaction and seismically induced settlement of loose and soft soils caused most of the damage, which included failure of bridge supports and damage to storage tanks. Wharves designed to withstand large lateral forces experienced little or no damage during the earthquake. Wharves constructed to withstand large lateral forces are not expected to result in significant impacts during an earthquake (Class III). Ruptured pipelines and storage tanks could release oil or product that could result in significant adverse impacts to the surrounding environment (Class I or II).

Mitigation Measures for CUM-GEO-1:

CUM-GEO-1: Implement Proposed Project measures GEO-2 through GEO-11.

Rationale for mitigation: Mitigation for Shore includes adherence to those measures presented in the Geotechnical Issues/Structural Integrity section. Those measures are specific to Shore Terminals and involve determination of any corrections that may be required to ensure structural integrity of the wharf and pipelines, and mooring procedures. Implementation of the mitigation for Shore Terminals would reduce impacts to less than significant. In response to accidental conditions, each project in the cumulative baseline would react in a different manner to seismic or structural stresses and require individual mitigation.

4.4.12 Environmental Justice

Impact CUM-EJ-1: Impacts to Minority or Disadvantaged Communities

Cumulative projects may have the potential to impact localized minority or disadvantaged communities and significant adverse (Class I or II) impacts would occur. Shore Terminals operations does not contribute to this impact.

The cumulative projects are likely located in areas containing some amount of minority or disadvantaged communities. For most of the project described in Sections 4.2.1 and 4.2.2 identifying the cumulative projects, impacts on minority or disadvantaged communities are not expected since most of the projects are water-based. For long-term land-based projects over the 20-year lease period, it is likely that new construction or modification of existing land-based projects could result in temporary or permanent impacts that may result in impacts to environmental justice if a business is moved or disrupted or if the new use would create a noise or traffic impact. Impacts would range from adverse (Class III) to significant adverse (Class I) that would not be able to be mitigated.

As similar to the Proposed Project, the cumulative projects combined can be expected to have cumulative impacts to biota, commercial and sport fisheries, land use, visual resources, due to impacts related to tanker and pipeline spills. Mitigation for cumulative environmental justice impacts must involve evaluation of each project individually and then address their contribution to the cumulative environment.

CUM-EJ-1: No mitigation is required.